

=> d his

(FILE 'HOME' ENTERED AT 11:14:03 ON 18 AUG 2006)

FILE 'CA' ENTERED AT 11:15:14 ON 18 AUG 2006

L1 5512 S (BROADBAND OR MULTIBAND OR HYBRID OR MULTIFREQUENCY OR
MULTIWAVELENGTH OR WIDEBAND OR MULTIMODE OR (WIDE OR MULTI OR
MULTIPLE OR PLURAL?)) (3A) (FREQUENCY OR BAND OR WAVELENGTH OR MODE))
(6A) (OSCILLAT? OR TRANSCEIVER OR TRANSMIT? OR SPECTRO? OR EMITTER
OR TRANSDUCER)
L2 7082 S (RADIO FREQUENCY OR RF OR RADIOFREQUENCY OR MEGAH? OR MHZ OR MEGA
HERTZ) (6A) (OSCILLAT? OR TRANSCEIVER OR TRANSMIT? OR SPECTRO? OR
EMITTER OR TRANSDUCER)
L3 257 S L1-2 AND HARMONIC
L4 188 S L3 NOT OPTICAL
L5 172 S L4 NOT (MASS SPECTRO? OR INFRARED)
L6 167 S L5 NOT FLUORESC?
L7 20 S L6 AND (TISSUE OR NONDESTRUCT? OR NON DESTRUCT? OR BIOLOGIC? OR
ANISOTROP? OR MODULAT? OR CANCER OR TUMOR OR PHYSIOLOG? OR DISEASE OR
ANOMAL?)
L8 115 S (L6 AND PY<2001) OR (L6 AND PATENT/DT AND PY<2003)
L9 97 S L8 NOT LASER
L10 82 S L9 NOT (NUCLEAR (2A) (FUSION OR REACTOR) OR RAMAN)
L11 93 S L7, L10

=> d bib, ab 111 1-93

L11 ANSWER 26 OF 93 CA COPYRIGHT 2006 ACS on STN
AN 127:43789 CA
TI High **harmonic** generation and turbulence of magnetoelastic excitations in
hematite single crystal
AU Preobrazhensky, V.; Pernod, P.
CS Inst. Electronique Microelectronique du Nord, Ecole centrale de Lille,
Villeneuve Ascq, 59651, Fr.
SO Journal of Applied Physics (1997), 81(8, Pt. 2B), 5709-5711
AB Strongly nonlinear resonance of the longitudinal magnetoelastic wave in
a hematite single crystal was studied exptl. Generation of >40 acoustic
harmonics by a sinusoidal **radiofrequency** magnetic field was obsd. in
periodic **oscillations**. Two typical kinds of bifurcations evoked by the
variation of external parameters (bias magnetic-field strength,
radiofrequency field frequency, and amplitude) were found. The 1st one
corresponds to a slow automodulation of the periodic ultrasonic
excitation. The 2nd one is accompanied by fast chaotic oscillations in
the temporal domain and by generation of a few incommensurate
frequencies in the ultrasonic spectrum similarly to quasiperiodic
scenarios of turbulence.

L11 ANSWER 40 OF 93 CA COPYRIGHT 2006 ACS on STN
AN 121:94718 CA
TI Josephson **broadband spectroscopy** to 1 THz
AU Edstam, J.; Olsson, H. K.
CS Phys. Dep., Chalmers Univ. Technol., Goeteborg, S-412 96, Swed.
SO Applied Physics Letters (1994), 64(20), 2733-5
AB The authors demonstrate the operation of a "Josephson **Broadband**

Spectrometer" (JOBS) with a frequency range and bandwidth of 1 THz. The JOBS uses the inherent frequency tuning of the Josephson oscillations ($f = 2 \text{ eV/h}$) as a probe of the complex impedance environment, $Z_L(f)$, of the Josephson junction. Spectra taken of microstrip resonators (YBa₂Cu₃O₇/SiO/Au) display up to nine **harmonic** resonances corresponding to a bandwidth of 1000 GHz. The authors find the surface resistance of YBa₂Cu₃O₇ to scale as f^2 over this frequency range, whereas the London penetration depth is frequency independent. The upper frequency limit of the measurement is set by the resonator loss whereas the JOBS presumably has an even larger intrinsic bandwidth.

L11 ANSWER 61 OF 93 CA COPYRIGHT 2006 ACS on STN

AN 101:100506 CA

TI Proposal for **radio-frequency spectroscopy** of molecular ions

AU Russell, D. K.

CS Dep. Chem., Univ. Leicester, Leicester, LE1 7RH, UK

SO Chemical Physics Letters (1984), 108(6), 562-4

AB A method is discussed for the detection of low-frequency spectroscopic transitions in gaseous mol. ions by monitoring the motion induced by inhomogeneous fields at the sum frequency of **harmonic** motion in an ion trap and the transition frequency. Numerical examples are given.

L11 ANSWER 64 OF 93 CA COPYRIGHT 2006 ACS on STN

AN 98:45054 CA

TI Nonlinear interaction of an r.f. field with a bulk superconductor

AU Bailey, G. C.; Ehrlich, A. C.

CS Nav. Res. Lab., Washington, DC, 20375, USA

SO Physics Letters A (1982), 92A(9), 457-60

AB The nonlinear interaction was studied between a pure superconductor In wire near T_c and a **transmitting rf** field of ~150 **MHz** and 0.1-0.4 W by a very sensitive intermodulation technique. The behavior of the 3rd-order intermodulation signal with temp. is qual. similar to the 3rd **harmonic** signal in magnetically impure samples, but with a width of 10 mK instead of 320 mK. The nonlinearity is extremely small. The d.c. magnetic-field-dependent signals at various temps. are given. A curvature which is concave upward occurs in contrast to that from $H_c(t) = H_c(0)(1-t^2)$, where $t = T/T_c$, when the value of H at which the transition occurs is plotted as a function of t . The precise origin of the signal and its variation with temp., rf power, and d.c. magnetic field are unknown.

L11 ANSWER 72 OF 93 CA COPYRIGHT 2006 ACS on STN

AN 94:38868 CA

TI Aligned atoms in strong **oscillating RF** fields. II. **Modulation** signals

AU Jacobson, E.

CS Phys. Inst., Univ. Tuebingen, Tuebingen, 7400, Fed. Rep. Ger.

SO Journal of Physics B: Atomic and Molecular Physics (1980), 13(18), 3595-604

AB **Modulation** signals contg. high-order **harmonics** of the fundamental radio frequency were obsd. in an expt. on aligned atoms. The amplitudes of the **harmonics** are examd. as a function of the static magnetic field. Resonance structures occur which relate to single- and multi-quanta transitions. The results agree with semiclassical calcns.

=> log y

STN INTERNATIONAL LOGOFF AT 11:41:23 ON 18 AUG 2006

=> d his

(FILE 'HOME' ENTERED AT 09:39:02 ON 18 AUG 2006)

FILE 'CA' ENTERED AT 09:39:34 ON 18 AUG 2006

L1 5512 S (BROADBAND OR MULTIBAND OR HYBRID OR MULTIFREQUENCY OR
MULTIWAVELENGTH OR WIDEBAND OR MULTIMODE OR (WIDE OR MULTI OR
MULTIPLE OR PLURAL?)) (3A) (FREQUENCY OR BAND OR WAVELENGTH OR MODE))
(6A) (OSCILLAT? OR TRANSCEIVER OR TRANSMIT? OR SPECTRO? OR EMITTER
OR TRANSDUCER)
L2 26 S L1 AND ANTENNA
L3 7082 S (RADIO FREQUENCY OR RF OR RADIOFREQUENCY OR MEGAH? OR MHZ OR MEGA
HERTZ) (6A) (OSCILLAT? OR TRANSCEIVER OR TRANSMIT? OR SPECTRO? OR
EMITTER OR TRANSDUCER)
L4 1158 S L1,L3 AND (TISSUE OR NONDESTRUCT? OR NON DESTRUCT? OR BIOLOGIC? OR
ANISOTROP?)
L5 174 S ELECTROMAGNETIC ANALY?
L6 10 S L5 AND (TISSUE OR NONDESTRUCT? OR NON DESTRUCT? OR BIOLOGIC? OR
ANISOTROP?)
L7 154 S L4,L5 AND (CANCER OR TUMOR OR PHYSIOLOG? OR DISEASE OR ANOMAL?)
L8 77 S L4,L5 AND (OVERTONE OR OVER TONE OR REFLECT?)
L9 257 S L2,L6-8
L10 167 S (L9 AND PY<2001) OR (L9 AND PATENT/DT AND PY<2003)
L11 99 S L10 NOT NMR
L12 91 S L11 NOT LASER
L13 87 S L12 NOT NUCLEAR (2A) (FUSION OR REACTOR)

=> d bib,ab l13 1-87

L13 ANSWER 26 OF 87 CA COPYRIGHT 2006 ACS on STN
AN 131:307407 CA
TI Endothelial nitric oxide gene knockout mice: cardiac phenotypes and the
effect of angiotensin-converting enzyme inhibitor on myocardial
ischemia/reperfusion injury
AU Yang, Xiao-Ping; Liu, Yun-He; Shesely, Edward G.; Bulagannawar, Manohar;
Liu, Fang; Carretero, Oscar A.
CS Hypertension and Vascular Research Division, Henry Ford Hospital,
Detroit, MI, 48202, USA
SO Hypertension (1999), 34(1), 24-30
AB The authors tested the hypothesis that nitric oxide (NO) released by
endothelial NO synthase (eNOS) is not only important in blood pressure
regulation but also involved in cardiac function and remodeling and in
the cardioprotective effect of angiotensin-converting enzyme inhibitors
(ACEi). With the use of a 2D Doppler echocardiog. system equipped with
a 15-MHz linear transducer, left ventricular (LV) morphol. and function
were evaluated in conscious eNOS knockout mice (eNOS-/-) and their wild-
type littermates (eNOS+/+). The authors also studied whether in eNOS-/-
mice (1) myocardial ischemia/reperfusion injury is more severe and (2)
the cardioprotective effect of ACEi is diminished or absent. In
comparison with the wild type, eNOS-/- mice had increased systolic blood
pressure (128 vs. 108 mm Hg) and decreased heart rate (531 vs. 629 bpm)
assocd. with increased LV posterior wall thickness (0.80 vs. 0.64 mm)

and LV mass (18.3 vs. 13.1 mg/10 g body wt.). Despite hypertension and LV hypertrophy, LV chamber dimension, shortening fraction and ejection fraction (indicators of LV contractility), and cardiac output did not differ between the 2 strains, which indicates that LV function in eNOS-/- mice is well-compensated. In eNOS+/+ mice, ACEi decreased the ratio of myocardial infarct size to area at risk from 62.7% to 36.3%, whereas in eNOS-/- mice this effect of ACEi was almost abolished: the ratio of myocardial infarct size to area at risk was 67.2% in the vehicle-treated group and 62.7% in mice treated with ACEi. Moreover, infarct size in vehicle-treated eNOS-/- mice was not different from eNOS+/+ mice given the same treatment. Thus, (1) endothelium-derived NO plays an important role in the regulation of blood pressure homeostasis; (2) NO released under basal conditions has no significant impact on cardiac function; and (3) ACEi protect the heart against ischemia/reperfusion injury in mice and that this effect is mediated in part by endothelium-derived NO.

- L13 ANSWER 44 OF 87 CA COPYRIGHT 2006 ACS on STN
 AN 126:310977 CA
 TI Broad-band microwave characterization of bilayered materials using a coaxial discontinuity with applications for thin conductive films for microelectronics and material in air-tight cell
 AU Belhadj-Tahar, Nour-Eddine; Meyer, Olivier; Fourrier-Lamer, Arlette
 CS Laboratoire de Dispositifs Infrarouge et Microondes (LDIM-EA253/DSPT4/MESR), Universite Pierre et Marie Curie, Paris, 05, Fr.
 SO IEEE Transactions on Microwave Theory and Techniques (1997), 45(2), 260-267
 AB A new measurement method of complex permittivity of bilayered materials has been developed using a coaxial discontinuity. The **electromagnetic anal.** is performed according to the "mode-matching" method. The **reflection** coeff. of the principal transverse electromagnetic (TEM) mode is calcd. by matching the fields at the interfaces of the layered material and using the orthogonality properties of modes in cylindrical waveguides. The complex permittivity of several known liq. or solid materials in bilayered structure are measured using this method. The exptl. results over a wide frequency band (1 kHz-18 GHz) are consistent with those in previous papers and with dc measurements.
- L13 ANSWER 50 OF 87 CA COPYRIGHT 2006 ACS on STN
 AN 124:311553 CA
 TI Using very low frequency EPR to define bulk characteristics of pharmacologic compartments of specific **tissues** in vivo.
 AU Halpern, Howard J.; Yu, Cheng; Peric, Miroslav; Barth, Eugene; Teicher, Beverly A.
 CS Department Radiology and Cellular Oncology, University Chicago Medical Center, Chicago, IL, 60637, USA
 SO Current Topics in Biophysics (1994), 18(1), 26-8
 AB The use of ESR at frequencies significantly lower than 1 GHz allows radiofrequency (RF) penetration of living **tissue** samples with less loss of sensitivity than is commonly believed. Using a 250 **MHz** EPR **spectrometer** and novel partially deuterated nitroxide probes expts. were carried out probing **physiol.** significant aspects of the body water of **tumors** in living mice. The concn. of mol. oxygen in this compartment

and parameters related to the microscopic viscosity were measured.

L13 ANSWER 57 OF 87 CA COPYRIGHT 2006 ACS on STN
AN 120:153638 CA
TI Spectral analysis of blood pressure and heart rate variability in
response to stress from air-jet in the Lyon rat
AU Blanc, Jocelyne; Grichois, Marie Laure; Vincent, Madeleine; Elghozi,
Jean Luc
CS Lab. Pharmacol., Fac. Med. Necker-Enfants Mal., Paris, 75015, Fr.
SO Journal of Autonomic Pharmacology (1994), 14(1), 37-48
AB Power spectral anal. of the frequency of wave-forms of blood pressure
and heart rate was used to characterize short-term fluctuations of these
parameters in three strains of conscious Lyon rat, normotensive (LL and
LN) and hypertensive LH. A mild stress produced by means of a jet of
air elicited blood pressure rises, assocd. with tachycardia. This
response was of similar magnitude in the three strains. The stressor
amplified the medium frequency (195-605 mHz) Mayer waves of blood
pressure and heart rate which are under autonomic control. Clonidine
(10 µg/kg, i.v.) lowered blood pressure and heart rate and dramatically
reduced the amplitude of blood pressure and heart rate oscillations in
the frequency region of 195-605 mHz. A jet of air applied after
clonidine administration led to blood pressure rise assocd. with
tachycardia and enhanced **oscillations** in the 195-605 mHz region. These
results indicate that in Lyon normotensive and hypertensive rats, a mild
emotional stressor elicits blood pressure and heart rate rises assocd.
with spectral modifications **reflecting** sympathetic hyperactivity.
Clonidine lowers blood pressure and heart rate and reduces their related
variabilities. This effect is more pronounced in LH rats than in their
normotensive controls. Clonidine appears to reduce the autonomic
response to stress as indicated by the medium frequency oscillations.

L13 ANSWER 66 OF 87 CA COPYRIGHT 2006 ACS on STN
AN 116:12913 CA
TI High speed millimeter wave reflectometry
AU Vizard, D. R.; Lyons, B. N.; O'Dubhghaill, R.
CS Farran Technol. Ltd., Cork, Ire.
SO Proceedings of SPIE-The International Society for Optical Engineering
(1991), 1576(Conf. Dig. - Int. Conf. Infrared Millimeter Waves, 1991),
395-6
AB A **broadband** reflectometer based on high speed IMPATT **oscillators** was
developed. The reflectometer is capable of sweeping a bandwidth of
26.5-110 GHz in a time of 1.25 ms. The operating frequency range is
divided into 5 subbands. Each subband has an assocd. polarizer and
custom broadband **antenna**. The reflectometer can be used to study
plasmas with d. ranges 8.7×10^{18} - 1.5×10^{20} m³ with a previously an
obtainable resolu.

L13 ANSWER 82 OF 87 CA COPYRIGHT 2006 ACS on STN
AN 91:42630 CA
TI Monitoring silicon and manganese content in cast iron during melting
AU Luchevskii, B. A.; Pisarenko, L. Z.; Rusakov, I. A.
CS Minsk. Trakt. Zavod, Minsk, USSR
SO Liteinoe Proizvodstvo (1979), (3), 8-9

LA Russian
AB An electromagnetic **nondestructive** method was developed for the detn. of Si and Mn in gray iron melting. The method is based on measuring the amplitudes of the harmonic components of the elec. field. The Mn content was detd. from the amplitude of the 3rd harmonic and the Mn + Si content from the amplitude of the 1st one. The correlation factors between the Mn and Si contents and the amplitudes of the harmonics were 0.95 and 0.9, resp.

=> log y

STN INTERNATIONAL LOGOFF AT 10:26:01 ON 18 AUG 2006

=> d his

(FILE 'HOME' ENTERED AT 13:50:58 ON 17 AUG 2006)

FILE 'CA' ENTERED AT 13:51:10 ON 17 AUG 2006

L1 4667 S (BROADBAND OR MULTIBAND OR HYBRID OR MULTIFREQUENCY OR
MULTIWAVELENGTH OR MULTIMODE OR (MULTI OR MULTIPLE OR PLURAL?)) (3A)
(FREQUENCY OR BAND OR WAVELENGTH OR MODE)) (6A) (OSCILLAT? OR
TRANSCIEVER OR TRANSMIT? OR SPECTRO? OR EMITTER OR TRANSDUCER)
L2 321 S L1 AND (MEGAH? OR GIGAH? OR (MEGA OR GIGA) (1A) (HERTZ OR HZ) OR MHZ OR
GHZ)
L3 267 S L1 AND (RF OR MICROWAVE OR RADIOFREQUENC? OR RADIO FREQUENC?)
L4 27 S L2-3 AND (TISSUE OR NONDESTRUCT? OR NON DESTRUCT? OR BIOLOGIC?)
L5 123 S L2-3 AND (COMPOSIT? OR CONTINUM OR CONTINUA OR COHERENT OR
DIELECTRIC)
L6 351 S (BROADBAND OR MULTIBAND OR HYBRID OR MULTIFREQUENCY OR
MULTIWAVELENGTH OR MULTIMODE OR (MULTI OR MULTIPLE OR PLURAL?)) (3A)
(FREQUENCY OR BAND OR WAVELENGTH OR MODE)) (6A) RESONATOR
L7 286 S L6 NOT L1
L8 37 S L7 AND (MEGAH? OR GIGAH? OR (MEGA OR GIGA) (1A) (HERTZ OR HZ) OR MHZ OR
GHZ)
L9 60 S L7 AND (RF OR MICROWAVE OR RADIOFREQUENC? OR RADIO FREQUENC?)
L10 1 S L8-9 AND (TISSUE OR NONDESTRUCT? OR NON DESTRUCT? OR BIOLOGIC?)
L11 20 S L8-9 AND (COMPOSIT? OR CONTINUM OR CONTINUA OR COHERENT OR
DIELECTRIC)
L12 572 S L2-3, L8-9
L13 38 S L12 AND (CW OR CONTINUOUSWAVE OR CONTINUOUS WAVE)
L14 26 S L12 AND (ELECTRIC FIELD OR ELECTROMAGNET?)
L15 213 S L4-5, L10-11, L13, L14
L16 176 S L15 NOT LASER
L17 114 S L16 AND PY<2002

=> d bib, ab l17 1-114

L17 ANSWER 28 OF 114 CA COPYRIGHT 2006 ACS on STN
AN 130:167999 CA
TI **Dielectric** relaxation and calorimetric measurements of glass transition
in the glass-forming dihydroxyl alcohols
AU Park, In-Sung; Saruta, Kenichi; Kojima, Seiji
CS Institute of Applied Physics, University of Tsukuba, Tsukuba, 305-8573,
Japan
SO Journal of the Physical Society of Japan (1998), 67(12), 4131-4138
AB To study the mol. wt. dependence of the α -relaxation and glass

transitions of intermediate glass-forming materials, the **dielec.** and thermal properties were studied in both liq. and supercooled liq. states. By modulated DSC at 10 **mHz** and **broadband dielec. spectroscopy** in the frequency range from 10 **mHz** to 10 **GHz**, propylene glycol (PG) and its 5 oligomers (poly propylene glycol, PPG), which have the similar chem. structure but different mol. wts. 76-4000 g/mol, were studied paying attention to their fragility and cooperativity. The fragility of PG and PPGs from the **dielec.** and thermal measurements was analyzed and compared using both the intermol. cooperativity model and the Adam-Gibbs model. The Vogel-Fulcher energy and min. configurational entropy were evaluated for PG and PPGs using the comparison method. Their values were related to the d. of -OH end group and its intermol. H bonding. The strength parameter decreased with increasing mol. wt. indicating that PG monomer liq. is stronger than PPG liqs. The domain size at T_g, which was introduced by the Matsuoka's cooperativity model, was ~2 to 5 for PG and PPGs, increasing with mol. wt. The increase of the domain size in the vicinity of T_g is related to the larger nonexponentiality.

L17 ANSWER 34 OF 114 CA COPYRIGHT 2006 ACS on STN

AN 129:308972 CA

TI **Broadband dielectric spectroscopy** of conducting polyaniline

AU Youngs, I. J.; Lawrence, C. R.; Treen, A. S.; Stickland, T.; Miah, M.

CS the Structural Materials Centre, DERA, Hampshire, GU14 OLX, UK

SO IEE Proceedings: Science, Measurement and Technology (1998), 145(4), 166-170

AB **Dielec.** spectroscopy is used to probe both the conduction and polarization processes of a wide range of materials. The **dielec.** properties of conducting polymers were investigated over the frequency range 1 Hz-20 **GHz**. Initial measurements have been made on polyaniline at room temp. This particular conducting polymer is of interest since it is a mixed conductor, i.e., showing both electronic and ionic transport. Anal. of the frequency dependent complex permittivity can be used to indicate free charge conduction, charge hopping or ionic diffusion. Temp. dependent measurements are required to det. the type of hopping mechanism where such a process is obsd. Exptl. results can be compared to the range of theor. models available from the literature describing these processes.

L17 ANSWER 35 OF 114 CA COPYRIGHT 2006 ACS on STN

AN 129:268767 CA

TI **Dielectric** relaxation at the glass transition of confined N-methyl-ε-caprolactam

AU Daoukaki, D.; Barut, G.; Pelster, R.; Nimtz, G.; Kyritsis, A.; Pissis, P.

CS Department of Physics, Zografou Campus, National Technical University of Athens, Athens, GR-15780, Greece

SO Physical Review B: Condensed Matter and Materials Physics (1998), 58(9), 5336-5345

AB The effects of confinement on the glass transition of the nonassocg. glass-forming liq. N-methyl-ε-caprolactam were studied in detail by means of **broadband dielec. relaxation spectroscopy**, 5 Hz-2 **GHz**, and thermally stimulated depolarization current measurements, 77-300 K. The liq. was two dimensionally confined in the pores of controlled porous

glasses with mean pore diam. $d=2.5, 5.0, 7.5$, and 20.0 nm (Gelsil glasses) and $d=4.0$ nm (Vycor glass) and three dimensionally confined in butyl rubber with mean droplet diam. $d=7.6$ nm. The confined liq. is classified into two fractions: a relatively immobile interfacial layer close to the wall and the inner layer (vol. liq.). For the vol. liq. the α relaxation assocd. with the glass transition becomes faster and the glass transition temp. decreases compared to the bulk liq. These effects increase with decreasing d and are stronger for three- than for two-dimensional confinement. They can be understood on the basis of the cooperativity concept and the configurational entropy model of Adam and Gibbs. The systematic variation of d allows the detn. of the cooperativity length ξ at T_g to $\xi \leq 10-12$ nm.

L17 ANSWER 36 OF 114 CA COPYRIGHT 2006 ACS on STN

AN 129:253316 CA

TI **Dielectric** spectroscopy of liquid crystals in smectic, nematic, and isotropic phases confined in random porous media

AU Sinha, G. P.; Aliev, F. M.

CS Department of Physics and Materials Research Center, University of Puerto Rico, San Juan, 00931-3343, P. R.

SO Physical Review E: Statistical Physics, Plasmas, Fluids, and Related Interdisciplinary Topics (1998), 58(2-B), 2001-2010

AB The **dielec.** behavior of alkylcyanobiphenyls (5CB and 8CB) confined in porous matrixes with randomly oriented, interconnected pores with two different mean pore sizes (1000 and 100 Å) has been investigated by means of **broadband dielec. spectroscopy** in the frequency range from 1 mHz to 1.5 GHz. The confinement has a strong influence on the **dielec.** properties of liq. crystals (LCs), which resulted in the appearance of a low frequency relaxation process ($f \leq 10$ kHz) not present in bulk and a second new process due to the presence of surface layer at solid pore wall-LC interface. Bulklike relaxation processes due to the rotation of mols. around the short axis and due to tumbling of mols. are also obsd. All obsd. relaxation processes are of non-Debye type. Other obsd. differences between bulk and confined behavior are as follows: (a) the relaxation processes in confined LCs are not frozen even at temps. about 20 degrees below the bulk crystn. temp.; (b) in the temp. range corresponding to the anisotropic phase in pores, the temp. dependence of the relaxation times (τ) of the process due to the rotation of mols. around the short axis is non-Arrhenius; (c) the retardation factor $g=\tau/\tau_{is}$ is ~ 1.5 , whereas the typical value of g in bulk nematic LCs is ~ 4 . At the nematic-isotropic phase transition in pores smooth and small changes in τ suggest that the "isotropic" phase of LCs in pores is not bulklike isotropic phase with complete disorder in mol. orientations, and some degree of orientational order still persists.

L17 ANSWER 37 OF 114 CA COPYRIGHT 2006 ACS on STN

AN 129:238471 CA

TI **Dielectric** studies of glass transition in confined propylene glycol

AU Pissis, P.; Kyritsis, A.; Daoukaki, D.; Barut, G.; Pelster, R.; Nimtz, G.

CS Department of Physics, National Technical University of Athens, Athens, GR-15773, Greece

SO Journal of Physics: Condensed Matter (1998), 10(28), 6205-6227
AB The dynamical behavior of the glass transition of propylene glycol confined in droplets in butyl rubber (three-dimensional confinement, mean droplet diam. $d = 8-11$ nm) and in pores in controlled porous glasses (two-dimensional confinement, mean pore diam. $d = 2.5-7.5$ nm) was studied in detail by **broadband dielec. spectroscopy** (5 Hz-2 GHz) and of thermally stimulated depolarization current measurements. Effective medium theory corrections of the data are discussed. The results indicate the existence of a relatively immobile interfacial layer close to the wall. For the vol. liq. the dynamics of the glass transition becomes faster and the glass transition temp. T_g decreases compared to the bulk liq. The shifts ΔT_g increase with decreasing d , are larger in butyl rubber than in controlled porous glasses (three-dimensional vs. two-dimensional confinement) and vanish for $d \approx 10-12$ nm. These results are discussed in relation to those obtained with polymers confined in thin polymeric films (1-dimensional confinement) and in semicryst. polymeric samples and are explained from the cooperativity concept and the model of Adam and Gibbs. The cooperativity length ξ at T_g is $\xi \leq 5-6$ nm in both butyl rubber and controlled porous glasses. Interesting effects of confinement are obsd. on the shape of the **dielec.** response of the process assocd. with the glass transition.

L17 ANSWER 40 OF 114 CA COPYRIGHT 2006 ACS on STN

AN 129:41597 CA

TI Influence of chain extenders and chain end groups on properties of segmented polyurethanes. II. **dielectric** study

AU Pissis, P.; Kanapitsas, A.; Savelyev, Yu. V.; Akhranovich, E. R.; Privalko, E. G.; Privalko, V. P.

CS National Technical University of Athens, Athens, 15780, Greece

SO Polymer (1998), 39(15), 3431-3435

AB Thermally stimulated depolarization currents (TSDC) measurements (temp. range 77-300 K) and **broadband a.c. dielec. relaxation spectroscopy** (frequency range 10 mHz-2 GHz) were employed to investigate mol. mobility and microphase sepn. in model segmented polyurethanes (SPUs) from oligotetramethylene glycol 1000, 4,4'-diphenylmethane diisocyanate and different chain extenders. The magnitude of the interfacial Maxwell-Wagner-Sillars (MWS) polarization TSDC peak and of d.c. cond. sensitively reflect changes of the degree of microphase sepn. (DMS). The **dielec.** strength of both the primary and the secondary transition of the soft-segment-rich microphase are highest for the SPU with the highest DMS, whereas frequency (temp.) position and shape of the response are not significantly affected by DMS.

L17 ANSWER 42 OF 114 CA COPYRIGHT 2006 ACS on STN

AN 129:14076 CA

TI A **broadband pulsed radio frequency** electron paramagnetic resonance **spectrometer** for **biological** applications

AU Murugesan, Ramachandran; Afeworki, Mobae; Cook, John A.; Devasahayam, Nallathamby; Tschudin, Rolf; Mitchell, James B.; Subramanian, Sankaran; Krishna, Murali C.

CS Division of Clinical Sciences, Radiation Biology Branch, National Cancer Institute, NIH, Bethesda, MD, 20892, USA

SO Review of Scientific Instruments (1998), 69(4), 1869-1876

AB A time-domain **radio frequency (rf)** ESR (EPR) spectrometer/imager (EPRI) capable of detecting and imaging free radicals in **biol.** objects is described. The magnetic field was 10 mT which corresponds to a resonance frequency of 300 **MHz** for paramagnetic species. Short pulses of 20-70 ns from the signal generator, with rise times of less than 4 ns, were generated using high speed gates, which after amplification to 283 Vpp, were deposited into a resonator contg. the object of interest. Cylindrical resonators contg. parallel loops at uniform spacing were used for imaging expts. The resonators were maintained at the resonant frequency by tuning and matching capacitors. A parallel resistor and overcoupled circuit was used to achieve Q values in the range 20-30. The transmit and receive arms were isolated using a transmit/receive diplexer. The dead time following the trailing edge of the pulse was about 450 ns. The first stage of the receive arm contained a low noise, high gain and fast recovery amplifier, suitable for detection of spin probes with spin-spin relaxation times (T₂) in the order of μ s. Detection of the induction signal was carried out by mixing the signals in the receiver arm centered around 300 **MHz** with a local oscillator at a frequency of 350 **MHz**. The amplified signals were digitized and summed using a 1 **GHz** digitizer/summer to recover the signals and enhance the signal-to-noise ratio (SNR). The time-domain signals were transformed into frequency-domain spectra, using Fourier transformation (FT). With the resonators used, objects of size up to 5 cm³ could be studied in imaging expts. Spatial encoding of the spins was accomplished by vol. excitation of the sample in the presence of static field gradients in the range of 1.0-1.5 G/cm. The spin densities were produced in the form of plane integrals and images were reconstructed using std. back-projection methods. The image resolu. of the phantom objects contg. the spin probe surrounded by lossy **biol.** medium was better than 0.2 mm with the gradients used. To examine larger objects at local sites, surface coils were used to detect and image spin probes successfully. The results from this study indicate the potential of **rf** FT EPR for in vivo applications. In particular, **rf** FT EPR may provide a means to obtain physiol. information such as **tissue** oxygenation and redox status.

L17 ANSWER 52 OF 114 CA COPYRIGHT 2006 ACS on STN

AN 127:301937 CA

TI Relaxations and fast dynamics of the plastic crystal cyclooctanol investigated by **broadband dielectric spectroscopy**

AU Brand, R.; Lunkenheimer, P.; Loidl, A.

CS Experimentalphysik V, Universitat Augsburg, Universitätsstrasse 2, Augsburg, D-86135, Germany

SO Physical Review B: Condensed Matter (1997), 56(10), R5713-R5716

AB The **dielec.** loss of cyclo-octanol was studied in a very broad frequency window of >17 decades. The relaxational response was traced in the plastic and the supercooled plastic phase, which are governed by the same relaxational dynamics. Exptl. evidence is provided for two addnl. relaxational processes below the **GHz** region which contribute to the high-frequency wing of the α relaxation peaks. Near 100 **GHz** a loss min. shows up which cannot be ascribed to a simple transition from the α relaxation to the IR bands. As in supercooled liqs., addnl. fast processes seem to contribute to the **dielec.** response at these high

frequencies.

L17 ANSWER 56 OF 114 CA COPYRIGHT 2006 ACS on STN
AN 127:159047 CA
TI Relaxation and transport phenomena in corn seeds
AU Laudat, J.; Pissis, P.; Konsta, A. A.
CS Institute of Physics, Charles University, Prague, 121 16, Czech Rep.
SO Proceedings of SPIE-The International Society for Optical Engineering
(1997), 3181(Dielectric and Related Phenomena: Materials Physico-
Chemistry, Spectrometric Investigations, and Applications), 95-98
AB The low-frequency dynamics in cereal seeds (wheat and triticales) has
been studied by measurements of d.c. cond., thermally stimulated
depolarization current techniques (TSDC, 80 - 300 K) and by **broadband**
a.c. dielec. spectroscopy (10 Hz - 1 GHz) with the aim to understand its
relation to their **biol.** behavior. Such a broad overall frequency and
temp. range allows to investigate simultaneously the mobility of water
mols. in seeds, influence of water on mol. mobility of seeds
constituents (plasticizing effect, TSDC and a.c. data) and charge
mobility. Water in seeds freeze for concn. higher than crit. hydration,
whereas for lower hydration it undergoes a glass-like transition. Temp.
of this transition strongly depends on water content in the sample and
shifts by seeds drying from 180 K up to room temp. D.c protonic cond.
increases sharply above glass transition temp. Its dependence on water
content indicates percolative transport of protons along threads of
hydrogen-bonded water mols. with a percolation threshold in the range of
0.15 - 0.30 g water/g dry material. The **biol.** implications of these
findings are discussed.

L17 ANSWER 58 OF 114 CA COPYRIGHT 2006 ACS on STN
AN 127:95872 CA
TI **Dielectric** studies of polymer-water interactions and water organization
in PEO/water systems
AU Kyritsis, A.; Pissis, P.
CS Department Physics, National Technical University Athens, Athens, 15780,
Greece
SO Journal of Polymer Science, Part B: Polymer Physics (1997), 35(10),
1545-1560
AB Detailed investigations of polymer-water interactions and of the
organization of water in the poly(ethylene oxide) (PEO)/water system by
dielec. techniques are reported. They include thermally stimulated
depolarization currents (TSDC) techniques in the temp. range of 77-300 K
and **broadband dielec. relaxation spectroscopy** (DRS) techniques of
frequencies, 5 Hz-10 GHz, and temps., 173-300 K. The water content h
was varied between 0 and 1.21 (grams of water per g of dry PEO). The
secondary γ mechanism of PEO and the reorientation of absorbed water
mols. were extensively studied. The γ mechanism was found to be
plasticized up to water contents of about 0.20. The reorientation of
water mols. was studied in three different expts. and frequency/temp.
regions. The results suggest strong interactions in the PEO/water
system and indicate the presence of a sep. water phase at high water
contents.

L17 ANSWER 70 OF 114 CA COPYRIGHT 2006 ACS on STN

AN 123:155970 CA
 TI NLTL-based system for mm-wave and sub-mm-wave free-space **electromagnetic** measurements
 AU Konishi, Y.; Case, M.; Yu, R.; Rodwell, M. J. W.; Kamegawa, M.
 CS Dep. Elec. Computer Eng., Univ. California, Santa Barbara, CA, 93106, USA
 SO OSA Proc. Ultrafast Electron. Optoelectron., Proc. Top. Meet. (1993), 158-61. Editor(s): Shah, Jagdeep; Mishra, Umesh. Publisher: Opt. Soc. Am., Washington, D. C.

AB **Broadband** monolithic **transmitters** and receivers ICs are reported for mm-wave **electromagnetic** network measurements. The ICs use nonlinear transmission lines (NLTLs) and sampling circuits as ps pulse generators and detectors. Combining NLTLs and sampling circuits with monolithic broadband antennas, the pulse can be radiated and received for free-space measurements. The system with 250 **GHz** bandwidth was demonstrated using simple and convenient signal processing electronics. The system has sufficient signal to noise ratio for measurements to ~600 **GHz**, given suppression of the effects of source phase noise. A variety of mm-wave measurements are demonstrated.

L17 ANSWER 77 OF 114 CA COPYRIGHT 2006 ACS on STN
 AN 121:24437 CA
 TI **Broadband** time-domain-reflectometry **dielectric spectroscopy** using variable-time-scale sampling
 AU Hager, N. E., III
 CS Armstrong World Ind., Lancaster, PA, 17601, USA
 SO Review of Scientific Instruments (1994), 65(4, Pt. 1), 887-91
 AB Methods for increasing the bandwidth of time-domain-reflectometry (TDR) **dielec.** spectroscopy using variable-time-scale sampling are presented. Consecutive segments of the TDR transient are sampled with increasing time increments and the entire transient transformed into the frequency domain using a running Laplace transform. Instrumentation artifacts are identified and controlled by examg. reflected transients for stray artifacts prior to transformation, either on individual time scales or on a **composite** log time scale. Transform algorithms are verified using SPICE simulation in both time and frequency domains. Results are presented for a conducting salt soln., showing continuous **dielec.** spectra for 100 kHz to 5 **GHz** in the frequency domain, and requiring acquisition over six decades of time in the time domain to capture the entire response.

L17 ANSWER 78 OF 114 CA COPYRIGHT 2006 ACS on STN
 AN 121:23678 CA
 TI Fully protonated polyaniline: hopping transport on a mesoscopic scale
 AU Pelster, R.; Nimtz, G.; Wessling, B.
 CS II. Phys. Inst., Univ. Koeln, Cologne, 50937, Germany
 SO Physical Review B: Condensed Matter and Materials Physics (1994), 49 (18), 12718-23
 AB In order to clarify the transport mechanism in fully protonated highly conductive polyaniline, the origin and size of the electronic localization centers and barriers have to be detd. Dispersions of polyaniline in an insulating polymer have been studied by temp.-dependent **broadband dielec. spectroscopy** (5 Hz to 2 **GHz**, 100-320 K).

The electronic transport in the blends and in pure polyaniline is shown to be governed by three-dimensional (3D) hopping between mesoscopic cryst. regions surrounded by amorphous polyaniline and not by intermol. hopping or mol. scale disorder. Two independent approaches yield an av. size of 8 nm for the metallic regions in polyaniline with 3D extended electron wave functions. The barrier width is estd. to be 1.6 nm. Cryst. metallic regions with an amorphous shell correspond to the primary particles which were found in morphol. studies.

L17 ANSWER 92 OF 114 CA COPYRIGHT 2006 ACS on STN

AN 110:241391 CA

TI Broadband (up to 10 **GHz**) electron-paramagnetic-resonance spectrometer: cw implementation with direct detection

AU Robinson, Kenneth A.

CS Five Oaks Res. Inst., Yellow Springs, OH, 45387, USA

SO Review of Scientific Instruments (1989), 60(3), 392-5

AB The design principles for a broadband (up to 10 **GHz**) electron-paramagnetic-resonance (EPR) spectrometer are presented. The upper frequency limit is detd. by the losses in the coaxial cables. The sample is inserted along the central conductor at the end of a short-circuited coaxial line that has an air **dielec**. An adequate H1 field is generated near the surface of the central conductor and is proportional to the **rf** current therein. The short circuit of the cable serves to sep. the E and H **microwave** fields with the sample predominately in the H-field portion. The instrument is currently operated in the **CW** mode in absorption with direct detection. The changes in the standing wave due to the resonance absorption are monitored through an E-field probe set at the E node away from the truncation. A similar geometry is expected to be usable for **broadband** Fourier transform (FT) EPR **spectrometry** through the addn. of appropriate pulse-generation equipment and signal-capture hardware. Also, obtaining frequency-swept spectra with or without frequency modulation is possible.

L17 ANSWER 93 OF 114 CA COPYRIGHT 2006 ACS on STN

AN 110:84506 CA

TI **Coherent broadband microwave spectroscopy** using picosecond optoelectronic antennas

AU Pastol, Y.; Arjavalingam, G.; Halbout, J. M.; Kopcsay, G. V.

CS T. J. Watson Res. Cent., IBM, Yorktown Heights, NY, 10598, USA

SO Applied Physics Letters (1989), 54(4), 307-9

AB **Coherent microwave** transient spectroscopy expts. are described using picosecond optoelectronic integrated antennas. The effectiveness of the exptl. setup for the measurement of the loss and dispersion properties of materials in the 10-125 **GHz** range is characterized using **microwave** filters of predictable behavior. Measurements of the absorption coeff. and refractive index of fused silica over this frequency band are also presented.

L17 ANSWER 94 OF 114 CA COPYRIGHT 2006 ACS on STN

AN 110:66588 CA

TI **Broadband microwave** absorption **spectrometer** for liquid media

AU Mukherjee, Pritish; Gosnell, Timothy R.; Bigio, Irving J.

CS Chem. Laser Sci. Div., Los Alamos Natl. Lab., Los Alamos, NM, 87545, USA

SO Review of Scientific Instruments (1988), 59(12), 2577-82

AB A **broadband**, continuous-sweep **microwave spectrometer** was constructed for measurements of the absorption coeff. of aq. solns. and other liq. media. The spectrometer makes use of the phase fluctuation optical heterodyne technique, which provides a direct measure of the **microwave** power deposited in the sample. Consequently, in contrast to the std. dielectrometric techniques that indirectly det. the absorption coeff. via sep. measurements of the real and imaginary parts of the **dielec.** const., this spectrometer directly measures the **microwave** absorption coeff. Broadband spectra were obtained by using a transmission line to couple **microwave** power into the liq. sample. The absorption spectrum for deionized water at 3-20 **GHz** is presented as an example and shows excellent agreement with calcd. values of the absorption coeff. based on previously published **dielec.** data.

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